

THE TREATMENT OF DIFFUSE SEPTIC PERITONITIS.¹

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WHILE in Chicago a month ago I was astonished to hear Murphy say that in his last 29 cases of diffuse peritonitis he had had but one death; and the purpose of my remarks this evening is to recount his technique in these cases and bring the subject before you for discussion. The majority of us, I think, have been in the habit of douching the peritoneum with large quantities of sterile salt solution, with or without partial evisceration, where the infection was diffuse. This has been our practice at the Pennsylvania Hospital, and our mortality is probably between 70 and 80 per cent., for we receive many cases in the last stages of septic peritonitis, where operation is undertaken as the only chance in an otherwise hopeless condition. If more than 20 or 30 per cent. of such cases recovered, we fancied our technique was rather superior.

While the procedures of Murphy do not present anything particularly new, he has assembled in his technique all of the good things to do and has eliminated the unnecessary or harmful ones. His principles, from a theoretical standpoint, will appeal to everyone, and in practice the theory is sustained by the excellent results obtained. The essentials of his technique may perhaps best be stated under six headings:

1. The rapid elimination of the cause of the peritonitis, whether it be a perforation of the bowel, a gangrenous appendix, a ruptured pus tube, etc. This must be done with the least possible handling of the peritoneal contents.

2. Drainage by tube of the lowest portion of the pelvis through a suprapubic opening, and free drainage through the operative incision.

¹ Read before the Philadelphia Academy of Surgery, November 6, 1905.

3. The elimination of all time-consuming procedures at the time of operation.
4. The semi-sitting position of the patient after operation, the so-called Fowler posture.
5. The absorption of large quantities of water through the rectum, which reverses the current in the lymphatics of the peritoneum, making the surface of that membrane a secreting instead of an absorbing one, and also markedly increasing the secretion of urine.
6. The prevention of peristaltic movements of the intestines by withholding all food or liquids by mouth, and perhaps by the administration of opium.

You will notice that none of these essentials is absolutely new, for all of us have practiced one or more of them at different times on different patients. But while doing some of them we have omitted others and at the same time perhaps have done things that were unnecessary and harmful to the patient. Let me elaborate these points a little more fully.

First. In removing the cause of the peritonitis the less the peritoneal surfaces are handled the better, for nature has thrown out protecting lymph which inhibits the absorption of toxic substances and in handling such surfaces there is danger of bruising and rubbing off the lymph, opening up a new avenue for absorption and infection. Therefore Murphy believes that no attempt should be made to sponge the peritoneal surfaces or to wipe off any lymph that may be found, as such manipulation would increase the danger of septic absorption.

Second. When the patient is placed in the Fowler position the fluids in the peritoneal cavity will tend to gravitate towards the pelvis, and in addition the action of the diaphragm during respiration will help to pump the fluids in that direction, making drainage of the lowest part of the pelvis with a tube very important. If there is sufficient fluid in the pelvis to fill the tube, each excursion of the diaphragm will pump a certain amount of it out, which will be absorbed in the dressing. It must be remembered that it is not the quantity of fluid present which is harmful, but rather the extent of the peritoneal

surface which comes in contact with it, so that a quart of pus contained in a round cavity would be less dangerous than an ounce thinly coating over the peritoneal surface.

Third. It is well known that patients with diffuse septic peritonitis stand a short operation well but a prolonged one badly; therefore, when all one's energy is directed to at once removing the cause of the peritonitis, and all other procedures except drainage eliminated, an operation can be speedily completed, on an average, perhaps in six or eight minutes. This naturally permits of a minimum amount of anæsthetic, thereby directly decreasing the chances of shock and vomiting after operation.

Fourth. The advantages of the Fowler position are so well recognized now that it only needs to be mentioned.

Fifth. Murphy's method of introducing large quantities of water into the rectum is novel. He inserts a nozzle containing three or four openings into the anus to which is attached a rubber tube leading to a bag. This bag is filled with water and elevated but a few inches above the plane of the rectum, the idea being that the water shall just trickle into the rectum not much faster than absorption takes place. In this way from a pint to a quart of water should be allowed to trickle in during an hour, the process being a continuous one and the flow so regulated that no accumulation of fluid takes place in the bowel. In other words, an attempt is made to run the water in as fast as it is absorbed. The object of having more than one outlet in the nozzle is that in case flatus accumulates in the rectum it will pass out through one of the openings in the tube while the others continue to discharge the water into the rectum. When it is desirable to stop the flow of water the tube is disconnected from the nozzle, the latter remaining in the anus, thereby avoiding irritation to the anus by the constant removal and insertion of the nozzle and at the same time facilitating the passage of flatus.

By this method large quantities of water will be absorbed within the first few hours after operation. This absorption does two things: First, It reverses the current of lymph in the peritoneal lymphatics so that instead of absorption taking place from the peritoneal surface the mouths of the lymphatics pour

out fluid, bathing the peritoneum with this free discharge. The posture, together with the action of the diaphragm, constantly sends this fluid downward to the pelvis, washing away the infectious material from the peritoneum in its descent, and escaping from the pelvis through the drainage tube. Second, The free absorption of the fluid from the rectum stimulates the heart and kidneys, and largely increases the amount of urine passed, eliminating through this channel the septic material which has gained entrance to the circulation. After the ordinary abdominal section in a non-septic case the average amount of urine secreted in the first twenty-four hours is perhaps 15 ounces, and in the presence of sepsis it is apt to be even less. In the first case that I shall report this evening more than 60 ounces of urine was secreted in the first twenty-six hours.

Sixth. Stopping all food and liquid by mouth will check peristalsis and prevent the dissemination of septic material by peristaltic movements. The absorption of large quantities of fluid by rectum is quite sufficient to sustain the patient for forty-eight hours or more, but if the condition of the patient is so precarious that food seems a necessity, small quantities of it can be run into the rectum with the water.

As an example of the results obtained by this method let me relate briefly the histories of two cases; one representing the fulminating type of perforating appendicitis in which perforation takes place within a few hours after the onset of the first symptom, without protecting abdominal adhesions: the other a case of walled-off appendiceal abscess in which the abscess had ruptured into the general peritoneal cavity, where no adhesions were present.

CASE I.—A small, pale, thin married woman, aged 26, was admitted to the Bryn Mawr Hospital at 11 A.M., October 11, while in her third attack of appendicitis. The attack began the previous day at 8 P.M., with sharp abdominal pain, which gradually became agonizing, but which was suddenly much relieved at 4 A.M., the estimated hour of perforation of the appendix.

On admission the temperature was 100.2-5; pulse 112. An hour and a half after admission an incision was made through

the right rectus, and immediately on opening the peritoneum there was an escape of a considerable amount of purulent fluid with shreds of lymph floating in it. The appendix was ruptured, partially gangrenous and bound down at its base by rather old adhesions, but the remainder was without adhesion to the surrounding viscera. There was a general diffuse peritonitis, (no attempt at walling off), with occasional patches of lymph coating the intestines, while the head of the cæcum was much inflamed, intensely red and the peritoneum had lost its glistening character. The appendix was removed, a puncture made through the abdominal wall in the median line two inches above the pubis for the admission of a drainage tube which led to the bottom of the pelvis. Another drainage tube was inserted through the operative wound leading to the right iliac fossa, while the remainder of the incision was filled with loose gauze. No sutures were used. The duration of the operation was six or seven minutes.

• The patient was placed in bed in the Fowler position and the rectal enema at once begun. During the first twenty-four hours the patient received $12\frac{1}{2}$ pints of salt solution through the rectum, not more than 6 or 8 ounces of which was expelled. The temperature ranged from 98 to $99\frac{3}{5}$, and the pulse came down to the 80's. She had a fairly comfortable night after $\frac{1}{6}$ gr. of morphia had been given hypodermically. During the first twenty-four hours the abdominal dressings had to be changed twice owing to their complete saturation with a colorless fluid of a slightly sour odor, and in the first twenty-six hours 65 ounces of urine were passed. On the third day a little water was given by the mouth for the first time, and from then on the fluids were rapidly increased. The rectal enemas were stopped at this time. No purgatives were given and on the fifth day the bowels moved twice naturally. The remainder of the convalescence was uneventful, the temperature and pulse remaining normal.

CASE II.—An Italian aged 37 was admitted to the Bryn Mawr Hospital October 14, having been sick five days. The attack started with severe general abdominal pain and nausea. The pain shortly localized itself in the appendix region, and previous to admission he had two chills, with fever and sweats.

On admission temperature was $102\frac{2}{5}$; pulse 120; respirations rapid; tongue dry; general appearance of typhoid condition.

The abdomen was opened through the right rectus and an appendiceal abscess was found, which had ruptured into the general peritoneal cavity, the pus welling up through the incision with each respiration. A gangrenous, perforated appendix was removed, and the drains arranged as in the previous case without sponging the peritoneum or even removing the excess of pus which was flowing from the wound. The operation lasted about seven minutes. While on the operating table his pulse was recorded at 200.

During the first ten hours 9 pints of salt solution were given by rectum, about a pint of which was not retained. Temperature dropped to $98\frac{4}{5}$ and the pulse varied from 100 to 80. He passed 900 c.c. of urine during the first thirty hours. As in the previous case nothing was given by mouth until the third day, when water was begun and the fluids rapidly increased. On the third day, without purgatives, the bowels moved twice. The rest of the convalescence was uneventful.

These two patients recovered without a single untoward or alarming symptom. The rapid falling of the temperature and pulse to normal; the absence of further septic absorption; the free elimination through the kidneys of toxic material; the absence of distention, nausea and vomiting, etc., lead me to believe that the favorable termination was directly due to the method practised.